CMS and LHC Update

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For the CMS Collaboration



All Experimenters' Meeting Ist April 2013

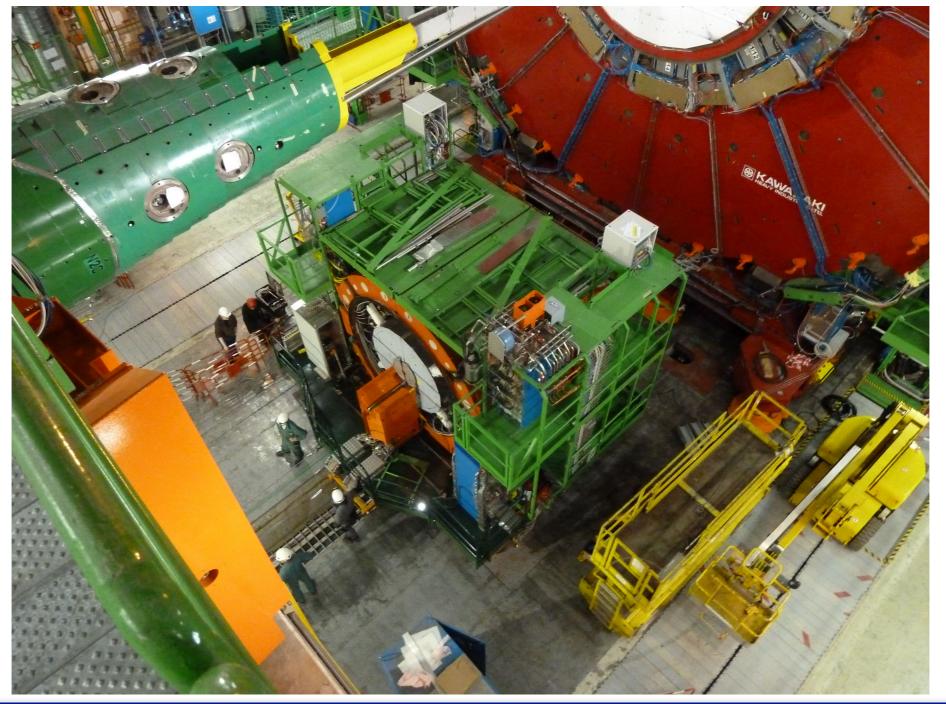


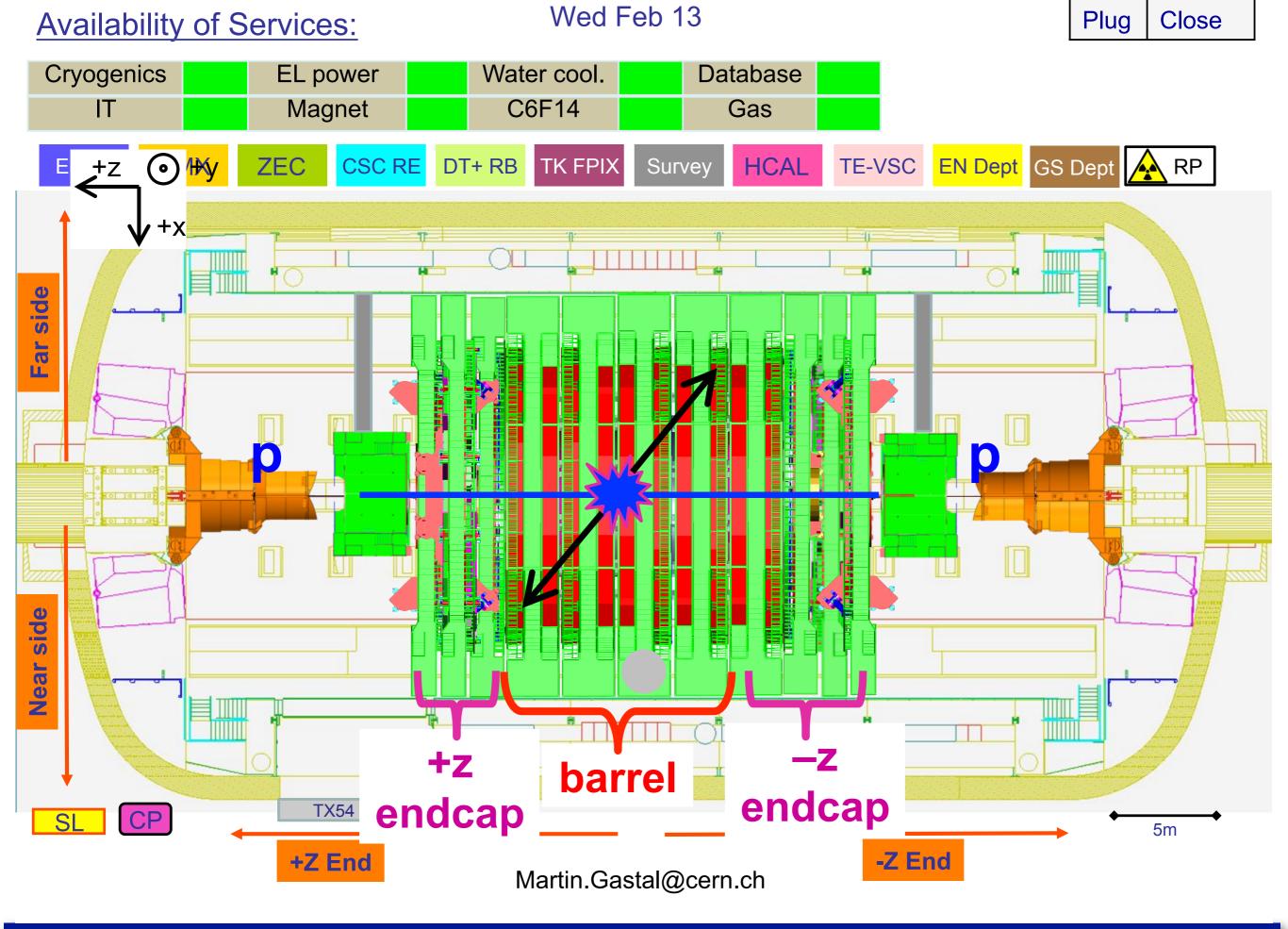


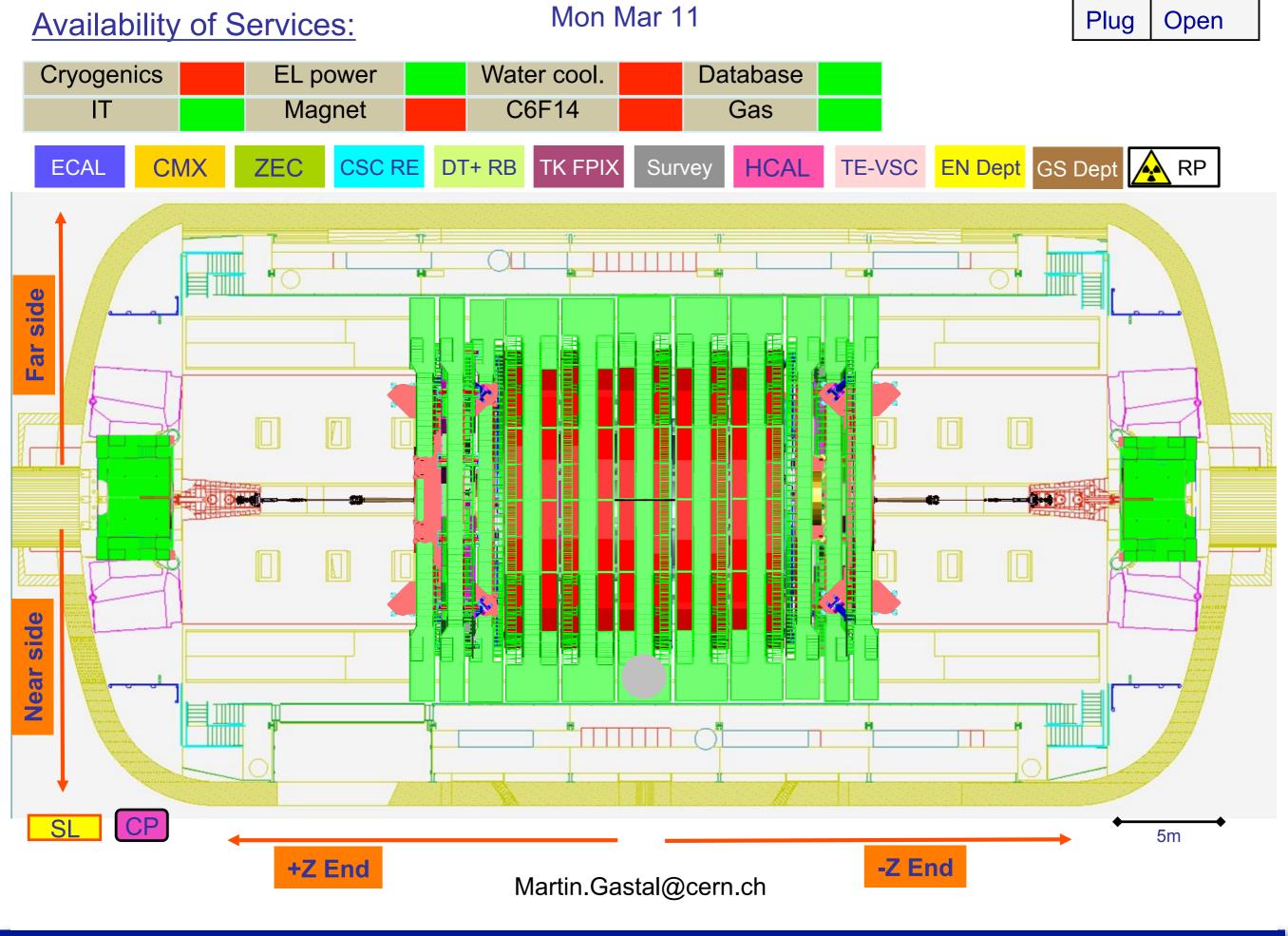
CMS Upgrade Activities

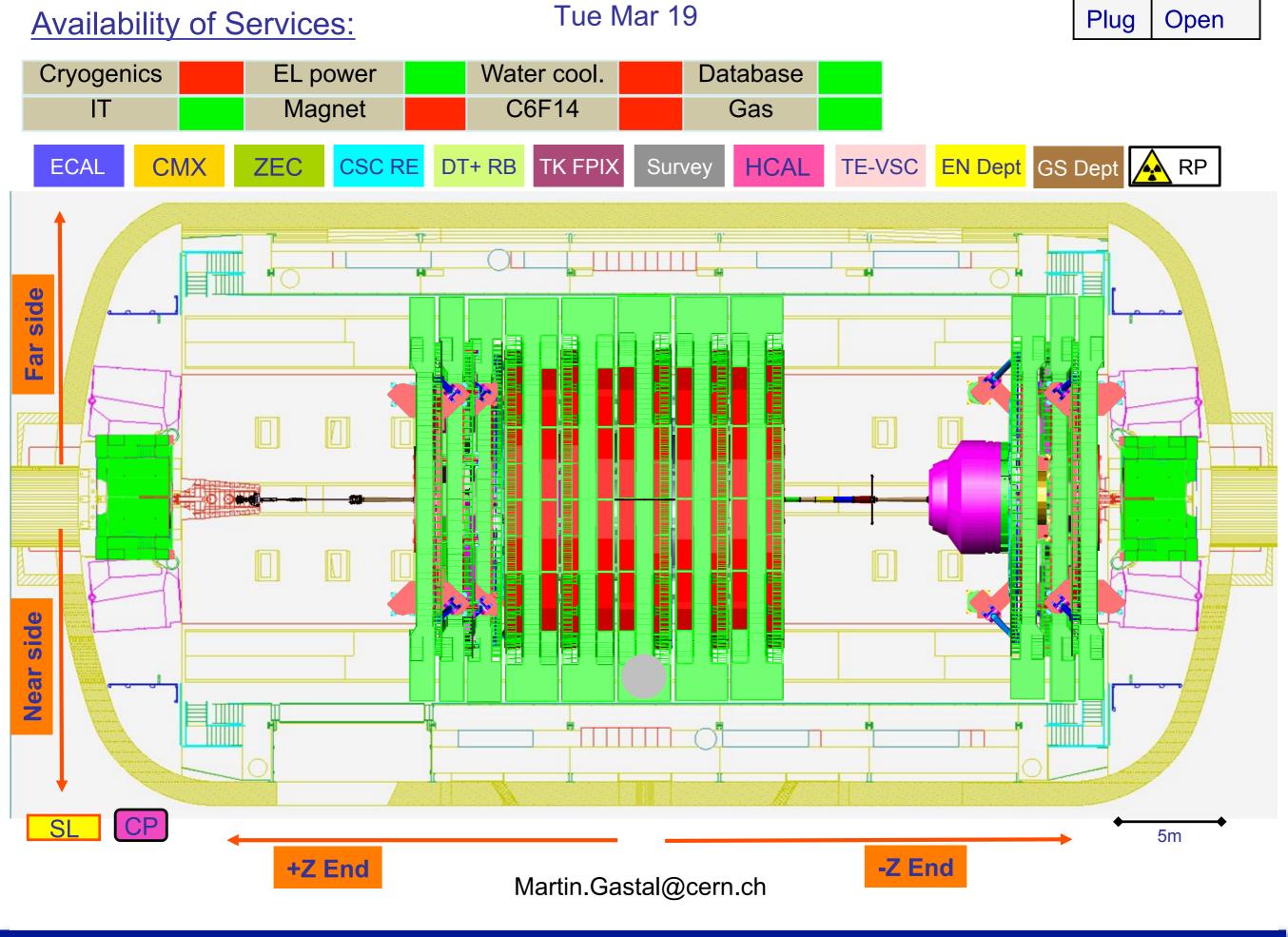


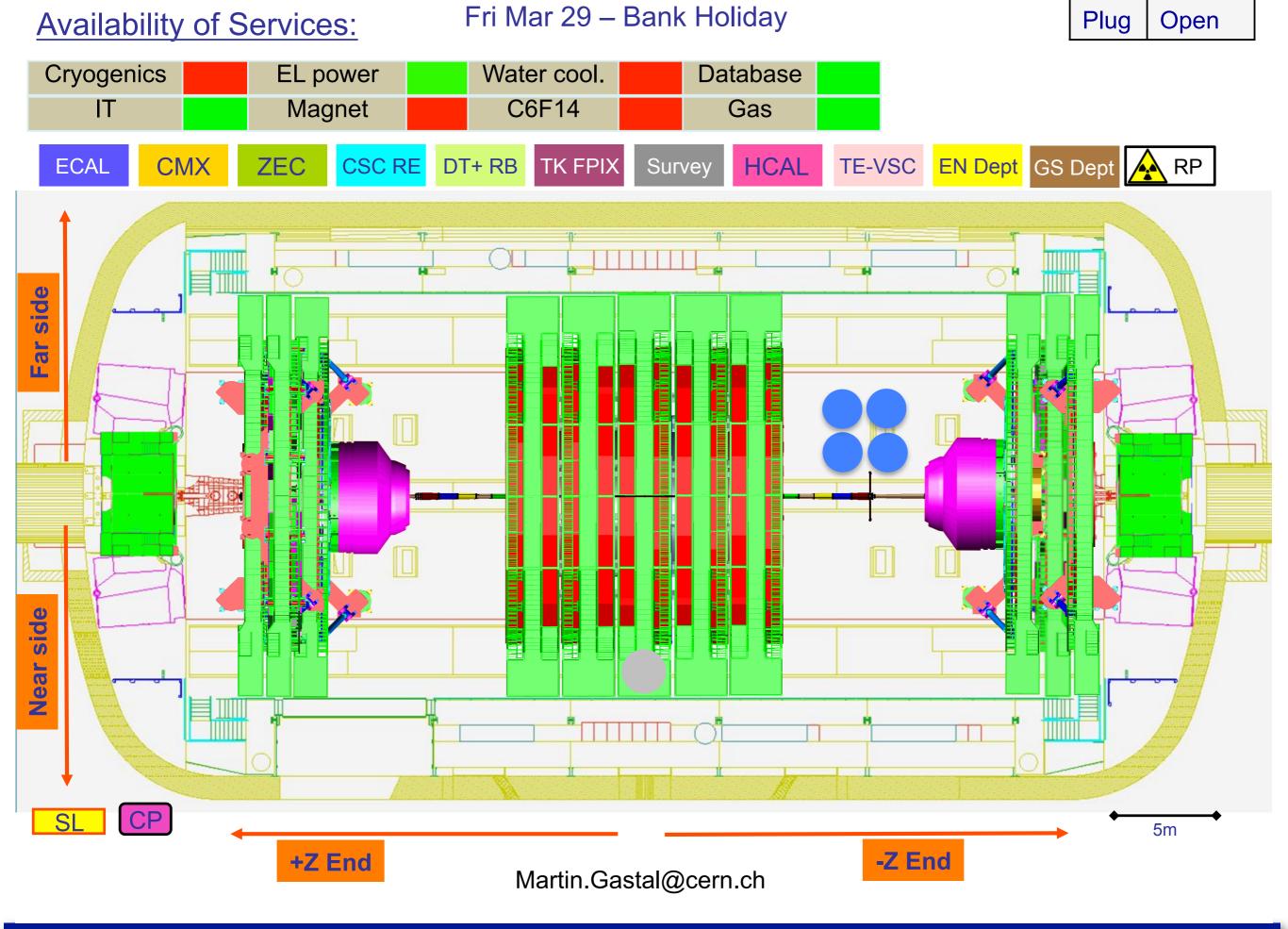
- It takes several weeks to bring CMS to fully open configuration
 - image shows HF (forward HCAL) being moved to garage
 - next few slides show various stages of opening













LSI Plan



- Many upgrade projects in progress
 - Currently a few days behind planned schedule

D Tas	sk Name	Duration		13			2014			2015	
4 0.					Qtr 2 Qtr	3 Qtr 4	Qtr 1 Q	tr 2 Qtr 3	Qtr 4	Qtr 1	Qtr 2
	art of LS1	0 days	Start of LS1	12/0	2			10	100		
	ailability of services	386 days	12/02					18/	/08		
40 Bri	ing CMS to full open config.	24.5 days		18	3/03						
107 Rep	place HF PMTs	73 wks	28/0					06/0	8		
108 Ha ı	rvest HPD from HO+; Remove CCM boxes from HE; EE/ES+	11.5 days	18/0	03 📥 (02/04						
121 Rer	move PIX & BP, TK seal inspection, EE/ES+ inspection	45 days	25/	d 3 💳							
217 Inst	stall TK seal, remove ME1/1, RE+1 maintenance, RE4 services, HB CCM	67.5 days		1							
249 Ins	stall YE+4, maintain YE+1, CCM+Z, VAX+Z	30.5 days			31/07 💬	11/09					
267 Ins	stall ME+42 Back Layer	7 days			12/09	20/09					
270 Ma	aintain Ecap+Z (ME+1/1, RE+ ME+, install ME+42RE+4)	41.5 days			23/09	1	19/11				
282 Per	rform work on YB0-Z with Full access to vacTank; HE-Z CCM	33 days		2	24/07 🔎	09/09					
297 Per	rform work on YB-1 -HO/DT/RPC	21 days			09/09	08/1	.0				
308 Per	rform work on YB-2 - HO/DT/RPC, EE/ES repairs, RE-4	31.5 days			08/1	0 🔎 2	20/11				
324 Inst	stall YE-4, VAX-Z, GIS-Z, TAS56, Maintenance YE-1, CCM for HE-Z	33.5 days			1	5/11 🟴	14/01				
Per	rform work on YB0+Z with Full access to vacTank	27.5 days			1	.9/11 🚃	08/01				
887 Per	rform work on YB+1 -HO/DT/RPC	17 days				13/01	04/02				
897 Per	rform work on YB+2 - HO/DT/RPC, EE/ES+	26.5 days				04/0	02 🚚 12,	/03			
112 M a	aintain Ecap-Z (ME-1/1, RE-ME-, Install ME-42RE-4)	42 days				15/01	13	/03			
125 Ins	stall new BP (+leak tests)	38.5 days				1	13/03 💢	06/05			
43 Bak	ke out new beam pipe	30 days					07/05	05/06			
l44 Ins	stall PIX,PLT,BCM	38.38 days					06/0	30/0	7		
183 Clo	ose CMS without T1-Z	13.63 days					;	30/07 🕎 18/	/08		
05 CM	AS close ready for Master Magnet Test	0 days						18/	/08		
06 Ma	aster Magnet Test + validate TK seal + CRAFT	3 wks						19/08 💣 08			
507 Lov	wer HF-Z, Move YE-3/4 out by 3.5m, Open YE-4 YE-3 gap	6.38 days						09/09 🗰 3			
524 Cor	mplete installation of ME-4/2 RE-4 + commissioning	2 wks						17/09 🍙	01/10		
525 Bri i	ing HF-Z to nominal position + install T1-Z	7.25 days						01/10 🗰	10/10		
539 Pur	mp down	21 days						10/10			
540 Ma	agnet Recommissioning	5 days						21/10	28/1	D	
541 Rec	commissioning for beam	10 days						10/1	1 🕇 24	/11	
542 CM	AS ready for beam	0 days					CMS	ready for bear	m 🍑 2	l/11	
543 Ma	aster Contingency	4 wks						24/	11 📥	05/01	
544 End	d of LS1	0 days	1					End o	of LS1	05/01	L



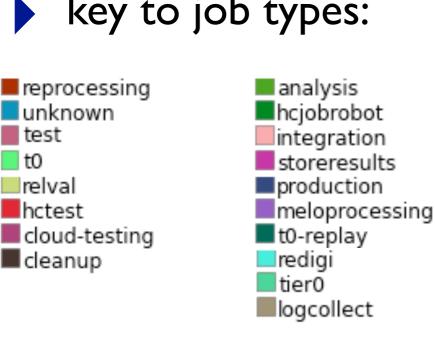
Computing status

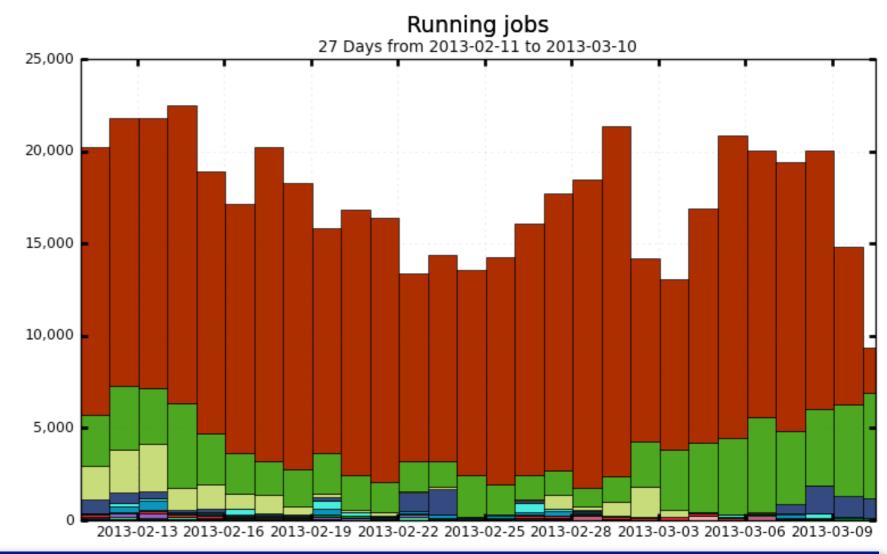


- Each week we'll focus in more detail on a single upgrade project
- This week: computing upgrade
- Current status: Re-reconstructing all 2012 data
 - significant contribution from the ROC, including roles in operations, coordination, and shifts for data certification



key to job types:



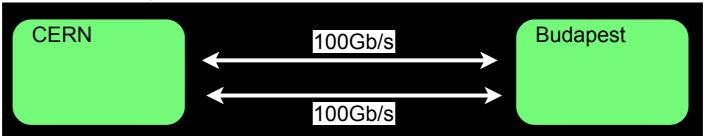




Computing upgrade plans



- Demands on computing will go up by ~factor of 6, while our capacity will only roughly double
 - need big efficiency gains
- HLT (High Level Trigger) cloud commissioning work ongoing to increase capacity
 - recently tested by running ~3500 data reprocessing jobs on the HLT
- Opportunistic computing increases capacity for processing tasks
 - recently used 8000 cores at the San Diego Super Computing Center
- CERN is deploying a remote computing facility in Budapest
 - 200Gb/s of network link to CERN at 35ms latency
 - To users this is indistinguishable from local CERN resources!
 - More such links are being commissioned

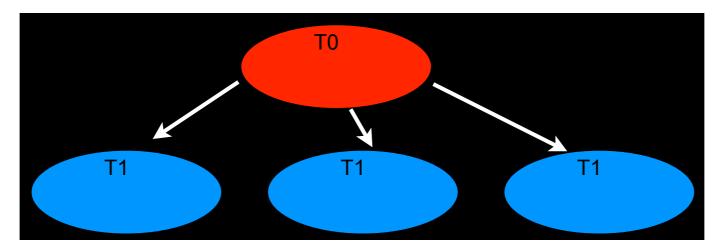




Efficiency improvements



- Increase efficiency by restructuring the processing infrastructure
 - decrease distinction between T1 and T2 sites, so we can benefit from the combined total of slots for processing
 - read data from remote storage for CPU intensive tasks
 - only functional difference between T1s and T2s will be that T1s are used for archival (tape storage)
- use TI sites for prompt reco (previously restricted to T0)



Lots of potential for improvement